REDAC NAS Operations Subcommittee

Jim Kuchar Spring 2021

NAS Ops Subcommittee – Spring 2021 Meeting

- March 16-17, virtual meeting using WebEx
- Agenda
 - Update on research drivers and landscape
 - **o Budget overview**
 - Subcommittee discussion on COVID-19 impacts
 - **o** Subcommittee discussion on updates to Research Landscape
 - Enterprise Concept Development; New Air Traffic Management Requirements
 - Runway Incursion Reduction
 - Weather Program; Weather Technology in the Cockpit
 - Flight Deck Data Exchange Requirements
 - **o Wake Turbulence**
 - Enterprise Human Factors; ATC / Technical Operations Human Factors
 - $\circ~$ Deep dives
 - UTM Roadmap
 - Operations Concept Validation & Infrastructure
 - NAS Integration of Transiting Operations (NITRO)
 - NASA xTM R&D Update

NAS Ops Subcommittee – Spring 2021 General Observations

- Machine Learning / Al will be critical technologies in future air traffic control, air traffic management and increasingly automated vehicles. The FAA is applying Safety Risk Management (SRM) tools to identify safety risks from new ML/AL technologies. Additional emphasis should be placed in developing enhancements and extensions to the existing SRM process to ensure ML/AI risks can be properly identified and mitigated.
- 2. A11.i Air Traffic Control / Technical Operations program is beginning to address job task requirements and training gaps for personnel at the Air Traffic Control System Command Center (ATCSCC). The subcommittee was pleased to learn about this new work which is important to strengthen the capabilities and performance of these critical personnel who may not have had directly-relevant training or experience with strategic traffic management challenges.

NAS Ops Subcommittee – Spring 2021 Highlights from COVID-19 Discussion (1 of 2)

- Acknowledged the success of the FAA and the aerospace industry in responding to COVID-19
 - Many efforts continued on pace (or even accelerated)
 - FAA able to perform TBFM adaptation remotely; focused R&D into cabin cleaning technologies and procedures, ...
 - Some disruptions
 - Deferred R&D for HITLs, wind tunnel testing, sensor installs
 - Some NAC milestones have slipped 1-2 years due to constraints entering facilities and performing training
- Operational impacts
 - Lower traffic levels but still peaks requiring traffic management
 - Observed increase in direct-to routes in low density Oceanic airspace
 - Cargo ops less impacted, but some operational incidents noted
 - Some supply chain slowdowns

NAS Ops Subcommittee – Spring 2021 Highlights from COVID-19 Discussion (2 of 2)

- Trends and opportunities
 - Interest in purpose-built freighters and increased autonomy in cargo operations
 - Migration out of cities may lead to demand for Advanced Air Mobility in suburban / rural locations
 - Opportunity to collect lessons-learned from start and end of pandemic
 - Catalog range of approaches taken
 - Potential to develop response playbooks
 - Build effective scenario-based training for future events
 - Strengthen modeling and forecasting tools to quantify impact of mitigations (masking, reduced load factors, ...) on disease transmission rate

NAS Ops Subcommittee – Spring 2021 Highlights from Research Landscape Discussion

- Continued interest in topics already included in Research Landscape
 - Mixed equipage operations
 - Certification of new entrants
 - Autonomous ground service equipment at airports
 - Advanced aircraft energy systems
- Recommended areas for more emphasis in Research Landscape
 - Risk-based decision-making applied to ATC (traffic management)
 - Advanced ground facility energy systems (airports, ATC facilities)
 - Communications technology evolution

NAS Operations Subcommittee Finding 1

- The FY21 Enacted RE&D budgets for A11.k (Weather), A11.q (Weather Technology in the Cockpit), and A11.o (Wake Turbulence) show significant reductions from prior levels: down to approximately 40%, 55%, and 55% relative to FY19 funding levels, respectively.
- Although major weather-related air carrier accidents are rare, they continue to be a concern especially for general aviation and helicopter operations. Weather remains the largest single cause of air traffic delay, and it is likely that weather-related delays will become increasingly problematic as the nation returns to pre-COVID-19 traffic levels.
- Research is needed to ensure that the improvements afforded by NextGen decision support capabilities are robust to weather conditions.
- Unmanned Aircraft System (UAS) and Advanced Air Mobility (AAM) concepts require consideration of weather impacts to enable them to operate safely and effectively. These operations pose unique requirements for aviation meteorology in the Earth's boundary layer. Of particular concern are the needs for improved weather sensing away from traditional airports and the need to better understand, model, and forecast low-level and urban-area weather.
- Concerns about aircraft wake turbulence also relate to the ability to model and forecast winds, and research may need to be expanded to safely enable upper-altitude (Upper E) operations involving particularly sensitive air vehicles such as long-endurance balloons.

- The NAS Operations subcommittee recommends that the FAA make a directed effort to improve awareness of the importance of weather-related research and the impacts that the FAA's prior weather research has had on improving the safety and efficiency of the National Airspace System.
- The subcommittee also recommends that the weather-related RE&D programs strengthen connections with major FAA programs and strategic thrusts including TBO, Future Flow Management, UTM, AAM, and NAS Integration of Transiting Operations (NITRO) to ensure that weather considerations are included and that a robust prioritized list of weather RE&D initiatives are identified to support those programs.

- Requested documents prior to next meeting
 - Charting Aviation's Future: Operations in an Info-Centric National Airspace System (NAS 2035 Vision)
 - Human Factors Impacts of Highly Automated Vehicles Research Plan

- Requested Deep Dive topics for Spring 2021 meeting:
 - Flight deck human factors, including remote pilot issues
 - Update from AEE on research on operational procedures
 - UTM roadmap update
 - NITRO update